

The ATLATL

"Too long have I hunted mammoth alone!"

Rich McWhorter

April 2003

The Newsletter of the World Atlatl Association, Inc
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Return of the Mammoth

August 2002

DNA scholars hope to stock Siberia 'park' with mammoths. Jurassic Park" was a work of fiction. Pleistocene Park is in the process of becoming fact. A joint team of Japanese and Russian scientists arrived in the Siberian province of Yakutsk late last month to excavate a number of creatures that have been extinct for millennia — including mammoths and woolly rhinoceroses.

They plan to extract DNA from the frozen remains, crossbreed the retrieved nuclei with the creatures' modern-day counterparts and return the resurrected dinosaurs to a vast "safari park" in northern Siberia.

"It probably sounds a little far-fetched, but it's absolutely possible' to do this," said Professor Akira Iritani, who is coordinating the project from Osaka's Kinki University.

And the 72-year-old Iritani knows what he is talking about. In January, he announced that the university's School of Biology-Oriented Science and Technology, of which he is the dean, had transplanted a spinach gene into a pig to change the animal's fat into less fatty linoleic acid. The result is healthier pork products.

Iritani and the Mammoth Creation Society, based in



Miyazaki Prefecture, first hit the headlines in the mid-1990s when they announced plans to resurrect ancient animals, as he terms them, that roamed the Earth 20,000 years ago.

The group has organized several expeditions in recent years in search of remains to retrieve usable DNA. Ideally, they want to regenerate a mammoth.

"The best way to clone one of these animals is to find frozen sperm, but that is very difficult," Iritani

said. "Alternatively, a portion of muscle, skin or any piece of tissue can be a good source of viable DNA.

There are believed to be ten million mammoths buried in the permafrost in Siberia, but because of the sparse population in the region only around one hundred specimens have been recovered. "The most important thing is to find a good carcass. We need to find specimens that were frozen immediately after death and have remained at a temperature of between minus 25 and minus 30 ever since," he said.

And that is what his team is searching the Siberian tundra for. The 10-member group has traveled to the town of Chokurdakh, close to the East Siberian Sea and more than 500 km north of the Arctic Circle, to a site identified last year by local people as having numerous remains buried in the permafrost.

The search area was narrowed to several hundred square meters of tundra and the aim was to recover samples bearing viable DNA from the Siberian tiger, steppe lions, giant deer, ancient foxes and the ancestors of the Siberian horse, as well as mammoths and woolly rhinos, before returning to Japan.

The team's return was delayed to mid-August by its discovery of what are believed to be the right foreleg and left hind leg of a woolly mammoth.

Iritani said a lot of work remains before the two samples can be positively identified, and it may take up to two months for Moscow authorities to grant permission for their transport to Japan.

Iritani has been working in collaboration with a university in Bangkok and as soon as usable mammoth DNA has been identified, an elephant will be artificially inseminated with the nucleus. Each generation of cross-bred mammoths will more closely resemble the genetic inheritance of its forefathers as females are impregnated with more DNA from the male mammoth.

The same process will be used with the other beasts, and in as little as 20 years, Iritani said, these long-extinct creatures will once again be roaming the steppe.

"It all depends on getting good-quality tissue, of course, but we will eventually be able to produce many, many animals," he said. "At present, the success rate for cloned animals is not so high, but in a few years we will have the technology to repair recovered DNA that has been slightly damaged. We'll store any damaged DNA that we find. We're not going to give up this project."

The ultimate aim is the Siberian sanctuary.

"The last time I was over there, the Russians showed us the place they will provide to build Pleistocene Park," Iritani said. "We flew over it in a helicopter and the quality of the grass there seems to be perfect for the animals we're working on."

The park will cover an area about twice the size of Japan, he said, and at present the area has no human inhabitants. Those behind the planned park are already populating the site in north-east Siberia with other species from the Ice Age in hopeful anticipation of the mammoth's arrival. There are currently hundreds of wild horses and musk ox grazing the land by the River Kolyma, and talks to import bison from Canada are already underway.

As well as facilities for paying tourists, the reserve will need to provide shelter for the animals that are returned there, Iritani said, as he believes Siberia's elements were far less severe 20,000 years ago than they are now.

Iritani's search for a frozen mammoth began in 1996 and he is now a leading member of the Mammoth Creation Society, which in summer 1999 recovered a section of skin from what they believed at the time was a mammoth.

Their hopes were dashed 12 months later when it was determined that 90 percent of the skin's DNA sequence matched that of the Indian rhinoceros, although Kazufumi Goto, a professor of reproductive physiology at Kagoshima University and a member of the group, said the discovery was still valuable.

Iritani said one of the goals of his quest is to draw attention to the fact that the permafrost is melting — uncovering these creatures in the process — as a result of global warming.

¹ Cow success may help clone mammoth

YAMAGUCHI (Kyodo) A group of Japanese and Chinese researchers has succeeded in cloning two cows using skin cells from a dead cow embryo kept frozen at roughly the same temperature as the Siberian permafrost, a Japanese member of the group said Saturday.

Japanese researchers believe the breakthrough will accelerate their efforts to clone the extinct woolly mammoth, which existed between 1.6 million and 10,000 years ago.

SCIENTIFIC BREAKTHROUGH

The Japan Times November 25, 2001

Study the past, if you would divine the future. -- Confucius

Nature is often hidden, sometimes overcome, seldom extinguished. -- Francis Bacon



Photos from
previous years
at Wilder
Creek



**May 23, 24, 25 & 26, 2003, Memorial Day Weekend
WAA Annual Meeting
At Wilder Creek Conservation Club near
Marshall, MI**

Held in conjunction with the Annual
Primitive Archery Rendezvous & Michigan Atlatl Association
Atlatl Marathon

Schedule of events for the 16th annual WAA meeting:

Friday - European and 3-D courses open at 10am
3pm until dark. . ISACs will be held
7pm - Board of Directors Meeting
8pm - Special guest speaker: Bob Berg presenting: Hunting
with the Atlatl. Bob will give a presentation about his
extensive hunting experiences. Then he'll moderate an atlatl
hunting symposium afterwards. Other successful hunters are
invited to speak, if they wish, about their hunts, about atlatl
hunting laws in different states, and what folks are doing to
change the laws.

Saturday – Atlatl Marathon AKA the Triple Double:
1 European, 1 3-D, 1 ISAC, followed by another European,
another 3-D, and the MAA round. That's 146 throws for the
WAA Grand

Champion Award. Also awards for individual contests all day.
Noon - Chris Oberg will set up a live kayak throw in Wilder
Pond and also make a presentation about Inuit, Aleut and
other Arctic atlatl styles. He will let people try throwing at a
target from his kayak

6pm - Annual Membership Dinner catered by Wilder Creek.
\$10 per adult, \$7 per child under 12. **Advance**

**reservations by May 15th are required, please use
the pre-registration form included in this newsletter**

7pm - Annual WAA Membership meeting.
8pm - Special guest speaker: John Whittaker, Grinnell
College professor and author of Flintknapping; Making &
Understanding Stone Tools presenting: Throwing with the
Atlatl: Myths, Theories, and Photographs.

Sunday – All individual contests running all day. Awards
for each.

Noon – Special guest speaker: Gary Fogelman of Indian
Artifact Magazine makes the slideshow presentation: Fluted
Point Types and Distribution in Pennsylvania.

8pm - Special guest speaker: Kevin Finney presents: A Spear
Thrower's Garden; Technology, Innovation and Change
during the Early Woodland Period :Explore theories of the use
and adaptation of the atlatl during the one of the
greatest periods of technological development in Michigan's
prehistoric past.

This presentation will also examine the broader context of
early woodland life ways, technologies and traditions through
the presentation of visual slides as well as both original and
reconstructed artifacts. Outdoors or in the Clubhouse if
inclement.

Monday – ISACs **first thing in the morning**. A variety of
other targets will remain up until early afternoon.



Range Fees: Michigan, European, ISAC & Novelty contests
are free.

However target replacement donations to the Michigan
Atlatl Association are accepted and greatly appreciated. The 3-
D course is \$8.00 a day or \$15.00 for the weekend, and will be
open Sat and Sun 8am to 4pm. The 3-D course is part of the
Atlatl Marathon and WAA Grand Champion competition on
Saturday.

Atlatl Village: Atlatl vendors and the WAA, the MAA, the
Great Lakes Primitives and the Michigan Flintknappers will all
have booths set up next to the ISAC range. The MAA will host
atlatl and dart-making workshops, the Great Lakes Primitives
will host primitive skills demonstrations and workshops.
Knapping pits will abound.

A number of unofficial, fun atlatl tournaments will run all
weekend including Wilder Creek's bear target set up across
the pond. Amaze the archers and general public with the range
of an atlatl thrown dart! Also featuring the MAA's Running Bear
and Speedy Beaver challenge.

Registration: Please register in the castle upon arrival. No
alcohol or firearms please. Pets are allowed but must be
leashed at all times and immediate clean up is a must.



Directions and links:

Marshall is conveniently located on I-94 between Chicago
and Detroit just southeast of the intersection of I-94 and I-69.

Nearest Major Airport is Detroit Metro (DTW) 70 mi. east of
Marshall on I-94.

Amtrak serves Battle Creek, Albion, and Jackson. All near
Marshall.

**From downtown Marshall take Homer Rd. south
approx. 4 mi. On the right will be Eaton Corp. Proving
Grounds. Just past B Drive South turn left on D Drive
South. Wilder Creek will be on the left. Follow the signs.**

Although located on D Drive South, the official address is:
19825 Homer Road, Marshall, MI 49068 Ph. (269) 781-8506

Here's a link to local hotels:

<http://www.marshallmi.org/findmembers.taf?function=stay>

And one to local restaurants:

<http://www.marshallmi.org/findmembers.taf?function=eat>

A copy of the Marshall yellow pages is at:

<http://www.crgdirectories.com/marshall/yellow/a-z.html>

Marshall Area Chamber of Commerce · 424 E. Michigan Ave.

Marshall, MI 49068 1-800-877-5163 or 269-781-5163

Hours: Monday – Friday 8:30 – 5:00, Saturday 10:00 – 4:00

Wilder Creek's website:

http://members.aol.com/ht_a/buoygenius/page16.html

Wilder Creek's e-mail: WilderCreek@AOL.COM

Camping

There is camping on site. Camping fees are for the weekend.

Tent camping costs \$10.00

Trailer or pop-up-\$20.00

RV's-\$25.00

There is no water or electric hook up.

The nearest state park to Marshall with RV hook-ups is 30 miles west at: Fort Custer Recreation Area, 5100 Fort Custer Dr., Augusta, Michigan 49012. State of MI campground reservation # (800) 44-PARKS or www.michigan.gov/dnr

Food: Club members serve food in the clubhouse all day long. The clubhouse has a spacious dining hall and modern restrooms. There are showers on site adjacent to the clubhouse.

2002 Pennsylvania State Championship

By Chuck Butorajac

Sept 20, 21: Saturday started out with light drizzle to off and on medium RAIN. Not enough to stop any of our throwers – we have thrown in much worse conditions. By 1:00 p.m. the sky cleared and it was 80 degrees for the rest of the competition. Due in part to the nasty weather forecast the turnout was lower than previous years... 18 competitors and 6 first time on-lookers.



Men:

1st Ray Strischek, 2nd Terry Keefer, 3rd Steve Barnett

Women:

1st place TIE Lori Majorsky and Sharon Keefer, 2nd Margie Takocho

Youth: Devon Johns 2nd Ethan Johns

ISAC Scores: Ray Strischek 92; Terry Keefer 89; Frank Takocho 84X; Andy Majorsky 80X; Lori Majorsky 74; Margie Takocho 65



In the park, Outside a museum (Treignes, Belgium).



On the wall, Inside a museum (Treignes, Belgium).

Photos sent in by Pascal Chauvaux



Berk sur mer (France

By Anne-Françoise.

This contest on November 3 + 4, 2002 was organized during the Salon Fest of Berk sur mer : People had the opportunity to take part to a lot of activities with "games" as central theme.

Everybody could play with forgotten games our grand parents used to play with. The archeogames were represented thanks to the bow and atlatl contest which occurred in the west dune of Berk. Bow contest under the rain on Saturday, Atlatl contest under windy conditions on Sunday.



The results of the competition are naturally very bad but do we take part for the scores?

The welcome and ambiance in Berk was great, everybody went back home with the sensation of

having gone on holiday.

Paynes Prairie Primitive Arts Festival

By Doug Leeth

February in Florida...what more can I say? This was my 3rd trip to Paynes Prairie.. My friend Bob Hanselman and I headed out bright and early Wednesday morning. Drove down by the coast to St

Augustine and then by the beach for a while. Stayed with a friend of ours that evening and headed to P.P. Thursday morning.

There were several folks already there and set up.

We saw some new faces this year along with the ones we get to see other years. Terry Powell was set up demonstrating his shell axes..yes SHELL. Reese Moore had one of his famous motorcycles there made entirely of bones. Very different. We watched Mark Bracken chip out a beautiful coral point. Ooga Booga was rained out



due to what seemed like a typhoon Saturday afternoon. We had planned to go atlatl fishing with Bob Berg that evening too. Oh well, there's always next year.



Saturday before the typhoon hit we had the atlatl competition.

Mark Bracken took 1st place, Doug Leeth took 2nd and George Miller was 3rd. (That was the 1st I'd met and thrown with George Miller..one heck of a nice guy.) Mark Bracken, Bob Hanselman, Terry Brock and I had some competition of our own on Sunday. Best 2 darts at 30 meters got the \$. We all threw and Mark and I tied for high score so we moved back to 35 meters and put in some more \$. From the 35 meters Mark took home the \$. Man he's lucky *grin* The top 5 ISAC scores for the weekend were.. Doug Leeth 87; Mark Bracken 86; Paul Weigel 76; George Miller 75; and Micah Mones 74.

All in all it was a great turn out and I had a wonderful time. Something about the look and feel of Florida just gets to ya.



EARLY ISAC RESULTS

By Lloyd Pine

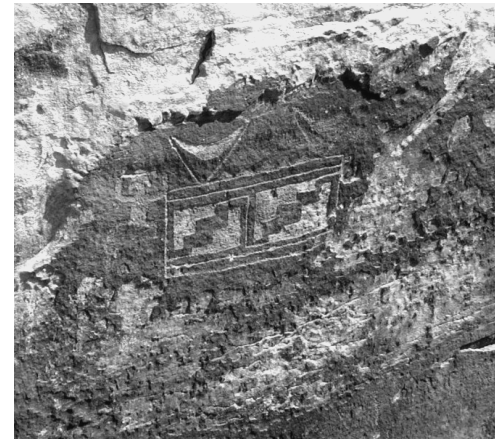
The results from only a few early contests are available.

However, the year is getting off to a good start. Scott Van Arsdale leads the men with a 93-XX. Scott threw this new personal best in his first contest of the year on January 11. Ray Strischek is in second place with 89-X, followed by Terry Keefer with 89. Doug Leeth comes in with an 87. Douglas Basset then follows with an 86-X, right ahead of Mark Bracken's 86.

Seven women have thrown scores over 50. Melissa Dildine is leading this group with a 72. Lori Majorsky follows her with 68, Sylvia Degullame with 66, Margie Takoch with 54, Sharon Keefer with 53-X, JoAnne Fogelman with 53 and Emily Kidder with 51.

The youth are lead by Charlie Bracken's 52. Nine year old Jeff Chiniewicz is in second with a 44, and Jacob De Rose is in third with 43.

Here's an interesting Petroglyph – photo taken within the Petrified National Forest. It's the first time I've seen a design like this pecked into rock, normally one will see this design only on pottery. Deano



Mardi Gras Contest

Baton Rouge, Louisiana

By Lloyd Pine

I owe many thanks to Ray Strischek, Terry and Sharon Keefer, and Charlie and Susie Brown for coming so far to help make this first-time event a success. Over Saturday and Sunday, more than 150 novices showed up to learn how to use an atlatl and dart. There were about another 50 that chose to just observe. The big turnout was mostly due to a very nice feature story, with a picture of Terry throwing, in the middle of the first page of the local news section of the Saturday morning paper.

With so many new people to instruct, the competition became almost secondary. However, thirteen newcomers threw the ISAC on Saturday and there were another dozen or so that threw the local contests. The WAA Grand Champion Award was based on the total of the best scores from the three local contests. Terry Keefer edged out Ray Strischek to win this award.

The response of the local people to this "new" event was really great. I have already received several e-mails and phone calls asking for more information. I have able to generate a list of 24 individuals/families that seemed particularly interested in doing something further. The plan is to cut river cane as soon as possible and to hold a dart building clinic and fun throw after it is dry enough to use. Maybe I will no longer be hunting mammoth alone.

Finger Freezing Contest Results
By Gary Fogelman

A storm the day before cut down on attendance, but 17 hardy souls braved the elements and made it to the shoot at Fogelmans, Turbotville, PA, Saturday, Feb 18 The day turned out sunny, temperatures just under freezing, and some slight breezes. Not bad!

The local contest consisted of 2 parts. Part 1 was a State Round, 5 positions, distances of 5-10-15-20-25 meters. One shot from each position out, then back. This made 10 shots in 1 round. The game was 3 rounds, or 30 shots. Scoring for this part was European scoring.

Part 2 of the local was an Ultra ISAC. For this, the ISAC target is numbered from 10 to 1! The x-ring is the size of a 50-cent piece!

While one could do the State Round, as many times as one wanted, I don't believe anyone did get more than one round completed. Only one chance was allowed on the Ultra ISAC. Then the 2 scores were added together. The highest youth, women and men's scores would advance to the Grand Championship round.

At the end of the day it would be Bobby Chieniewicz for the youth, Lori for the women and myself for the men competing for the Grand Championship Plaque. The event was to be an Ultra ISAC, so off we went, with, as usual, much cheering for.....Bobby and Lori. There was one, lone, muted, "go, Gary". When I looked up I saw it was Frank. Thanks, Frank, but then, you were staying over that night weren't you?



So, we're about to start, and, again, I think it was Frank who spoke up and said, " You know, out in Ohio for the Grand Championship round Ray has the youth throw from 10m, the woman from 15m, and the man from 20m."

My first thought, of course, was to go over and throttle Frank. My second thought was to say, "this ain't Ohio". Before I could act on either of these impulses, my rational side took over and said, "you know, that's a good equalizer, let's do that!" So we did. Bobby was psyched, he wanted that plaque. So did Lori. So did I, but I figured, using the Ultra target, this wasn't going to be easy. Bobby was up first and threw a 7, not bad on this target. Lori came up and also threw a 6. My first shot was a10! Holy Cow, that's pretty amazing. Second round, Bobby throws an 8! He's tough. Lori, though, yanks

one low and gets a 2. I know I've got to score well, Bobby's going to be the spoiler this day. My second shot....another 10! Holy Cow! Lori's realistically out at this point, but Bobby comes up for his third shot and throws a....6! That gives him 21, I've got 20 but one shot left. It isn't hard to goof on the Ultra target, but I had to keep it well on the board, and managed to do so with a 6.

Four new throwers joined us for this event. Two guys came over from New Jersey, while Terry brought two friends of his. All four were quick to pick up the concept and have the mechanics under control. Each will now have to seek the equipment that suits their style and, of course....practice, practice, practice.

Jo and I would like to thank everyone who showed up and participated. We'll be doing it again on May 10-11. Come join us!



| Local Results..... | State round | + Ultra | = Total |
|--------------------|---------------------------|---------|---------|
| Gary Fogelman | 261 pts, 30 hits =87 + | 72 = | 159xxxx |
| Terry Keefer | 251 pts, 28 hits =78 + | 59 = | 137xxxx |
| Jack Rowe | 210 pts, 25 hits = 58.3 + | 63 = | 121.3xx |
| Frank Takoch | 211 pts, 26 hits = 60.9 + | 58 = | 118.9xx |
| Mike Waters | 220 pts, 25 hits = 61 + | 38 = | 99x |
| Bob Chaffee | 194 pts, 24 hits = 52 + | 45 = | 97xx |
| Tom Goble Sr | 182 pts, 21 hits = 42.4 + | 35 = | 77.4xxx |
| Lori Majorsky | 152 pts, 19 hits = 31.6 + | 58 = | 89.6 |
| JoAnne Fogelman | 162pts, 20 hits = 35.9 + | 47 = | 82.9 |
| Melissa Dildine | 160pts, 20 hits = 35.3 + | 42 = | 77.3xx |
| Margie Takoch | 149 pts, 21 hits =34.7 + | 30 = | 64.7xx |

Here are the score-qualifying ISAC results of the day. Terry started off with a 49xx, but couldn't keep it up at 20. And Jack Rowe! I'll let Jack tell you about that.

| | |
|-----------------|------|
| Terry Keefer | 85xx |
| Gary Fogelman | 83x |
| Mike Waters | 77x |
| Bob Chaffee | 75 |
| Melissa Dildine | 68 |
| Lori Majorsky | 68 |
| Margie Takoch | 54 |
| JoAnne Fogelman | 53 |

**Friends are
 chocolate
 chips in the
 cookie of life!**

11TH ANNUAL ATLATL COMPETITION at the FREMONT INDIAN STATE PARK

By Trena Pikyavit

Atlatlists competing this June 6-7-8, 2003 will be in for a treat as Pete Weimer is planning big new events for the Annual Atlatl Contest that will be held on Saturday, June 7th on Five Fingers Ridge. ISACs will be held at the group site and will begin Friday afternoon.

Please send a note with your Name, City & State, No. of contestants - Mens, Women, or youth divisions with age, Camping- Yes_No, Motor home, Trailer or Tent. Send to Fremont Indian State Park 11550 West Clear Creek Canyon Road, Sevier, Utah 84766-6010 Attn. WAA. Due to continued budget cuts and overall lack of participants in the youth groups ages 6 thru 11 and 12 thru 15. All youths in these groups wanting to compete must be pre-registered by May 31st, 2003.

. We will be serving dinner Saturday at around 6pm in the group area campground. On the menu will be Lima beans with Ham hocks, dinner rolls, vegetables and a dessert. \$6.00 for adults and \$5.00 for children under 12. Please pre-register for the dinner with Trena Pikyavit at P.O. Box 77 Teasdale, Utah 84773 or (435) 425- 3742. Reservations for the dinner are requested and appreciated.

The Atlatl Contest will be the final event of weeklong activities, which will begin on Saturday, May 31. From May 31st to June 8th, Fremont Indian State Park will be celebrating "Utah Heritage Week" and "Fremont Indian Days". Events will begin with several workshops on Saturday, May 31st with lectures on Rock Art and Canyon Lore. There will be a crock-pot cooking demonstration and workshop followed by an evening meal by those attending.

Activities lasting throughout the week include various workshops, Lectures, Mountain Men Displays, Arts and Handicraft Sales & Trading, Canyon Tours, Wagon Rides and many different demonstrations. For those Atlatlists that normally attend the event at Fremont each year and would like to come in early; Pete will be giving an "Atlatl Materials Gathering" tour and trip on Friday, the 6th and a "Flint and Obsidian Collection" tour and trip on Sunday, the 8th. On these tours he will be pointing out where and how to find obsidian as well as mahogany and oak for your atlatls)

There are a lot of activities going on for the full week and Pete has given an open invitation to all to come in early during the week and have some fun and education prior to the Contest.

The special group area will be open for the WAA campers again this year. Campsites are available for motor homes, trailers and tents. Also available are restrooms and showers. Camping at the group site is FREE for WAA members. Those of you that would prefer to camp in Castle Rock camp ground must call four (4) weeks in advance to make reservations at (435) 527- 4631, there is a Fee Charged for Castle Rock. For those preferring not to camp, there are many good motels in Richfield, Utah (about 26 miles from the activities east on I-

70). For early reservations call four (4) weeks in advance at (435) 527- 4631 and the Park service would be happy to help you

For more complete information on the weeks celebration or to find out more about the trips contact Pete at the Fremont Indian State Park at (435) 527-4631 or feel free to call him at home at (435) 527-4478 or email at: peteweimer@utah.gov
WE LOOK FORWARD TO SEEING YOU THERE AND HAVE A SAFE TRIP

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Sun Mountain Gathering

July 11, 12, 13, 2003

Museum of Indian Arts & Culture, Sante Fe, NM

The organizers of this spectacular event has added ATLATL EVENTS (ISACs), atlatl demonstrations, hands on atlatl stuff, etc. ISACs will be held Friday afternoon, Saturday and Sunday morning as well as local competition on Saturday. Atlatl demos and hands on atlatl, plus talks and displays of atlatls planned. There will be something for everyone with the other activities scheduled - flintknapping, arrow making, heirloom garden talks, native Seed Search demos, stone axe demos, bone tool making , hot rock cooking, pottery making, cordage making, Native music and dance, archaeological lectures, exhibits, theater films, etc. etc.

This is your chance to participate in atlatl events as well as Indian Arts and Culture in possibly the oldest city in the U.S. come and enjoy Southwest Culture at its best in this beautiful setting.

Contacts: Chris Turnbow 505.476.1251 or cturnbow@miaclab.org or Bob Sizemore 520.466.6104 or bobandcarolathome@yahoo.com

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Roster of the WAA Board of Directors

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PaleoAleo@aol.com

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tkeeferr@cvn.net

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Bill Tate (CO) (303) 755-5591 atlatl@mho.net

MEET LENI CLUBB



Many of you know that when a question arises about the World Atlatl Association, the answer is usually... Ask Leni. So you say, "Who is Leni". Here is your answer!

Leni Clubb initiated the atlatl into the Colorado Archaeological Society, which then formed the

World Atlatl Association. She has held an office since the incorporation of the WAA: Vice President, Executive Secretary, and now Executive Secretary/Treasurer. She has the record books that she can refer to as to policy, decisions of the Board, previous articles in THE ATLATL. Leni also has an extraordinary memory for all things dealing with the World Atlatl Association. If you haven't seen the revival of the atlatl story on the WAA website www.worldatlatl.org look it up!

But Leni is more than just the wellspring of the World Atlatl Association. In 1997, she was approached by the artist Marilyn Cohen as a possible subject for her 'new project' - the 'paintings' of eighteen women in the U.S. who were outstanding in one way or another which resulted in "Teach Me The Songs My Mother Sang". The 'paintings' were actually collages with tiny bits of tissue paper to make the images. Along with the 'paintings' Ms. Cohen wrote poems about the women. These were made into notecards, with the painting on the front and the poem on the back. Here is the poem and the painting.

THE LEGEND OF LENI

Lenore English Clubb

She is a poet and a painter, an adventurer and world traveler.
She makes dream catchers, medicine wheels and Atlatls,
And uses a medicine bag around her neck as a divining rod,
To locate archeological excavation sites.

Her ancestors fought with George Washington at the Battle of Trenton

And she was a child star in silent films with a dog called Strongheart.

She knew Tom Mix, Janet Gaynor and Our Gang

But in 1926, when she was 12, her movie career came to an end
When her family went home to the quiet of Springfield, Ohio.

During the Depression she ran an elevator at Montgomery Ward,
married and had a child.

Left stranded by her husband, she got a Las Vegas divorce,
Vowing never again to be *a nothing in a housedress*.

Shy, quiet Lenore became Leni, as she set out to meet the world.

In Fairbanks in the 1940's she helped erect a Methodist Church
And on her 40th birthday entered the U. of Alaska to study
Botany, Psychology and German.

She lived among the natives in a village on an island 200 miles
east of Fiji,

Took a riverboat up the Amazon to live in a Peruvian jungle
camp,

And was tear-gassed during student riots on the streets of Peru.

In the psychedelic '60s, while working as office manager for the
Boy Scouts of America, she spent weekends among Haight
Ashbury's flower children.

She sailed for 18 days aboard a freighter to Greece to live in the
village of Halandri

Where she learned the Greek alphabet and taught herself to read and
speak the language.

Her 65th birthday was celebrated whitewater rafting in Colorado

And her 75th birthday in the Australian outback studying Rock Art
in Queensland.

She has been to Tahiti, Gibraltar and Marrakech, New Zealand and
Ecuador-

To the bottom of the Grand Canyon and the top of Machu Picchu.

Skied across the snows of Colorado pulled by a small plane

And has hung suspended in silence, free of gravity in a hot air
balloon above the desert.

In one of her poems she wrote: *Listen when I call.*

*Hear me, I am no illusion,
I am the wind.*

As a volunteer curator of artifacts for the Archeology Department of
the U. of Colorado

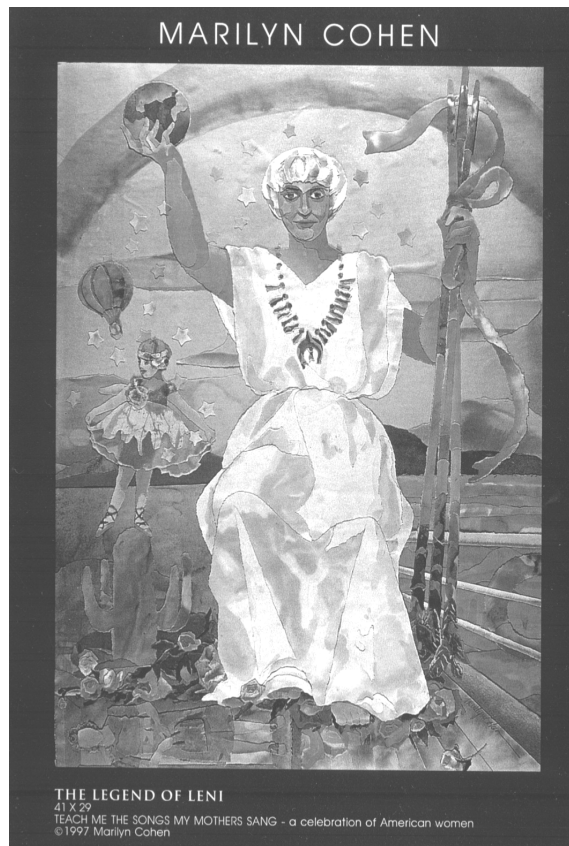
She came across a primitive spear-throwing weapon from the Cro-
Magnon Era called an Atlatl.

Using tree limbs, bamboo and turkey feathers, she shapes her own
Atlatl and spears

And since 1983, has competed in Atlatl tournaments around the
country.

Three-time Women's World Champion, she helped form the World
Atlatl Association in 1987.

In her 80's the Legend of Leni continues.



Leni,

May the
Great Spirit
send you
abundant
gifts.

May the
Sun and
Moon shed
their softest
light upon
you.

May the
four winds
breathe
gently
upon you.

7 Habits of Highly Effective Atlatlists

1. **Always practice as if you were in a tournament.** Perfect practice makes perfect. If you get sloppy when you practice, you will throw sloppily in the ISAC. If you can't learn to concentrate during practice, you won't be able to concentrate in the ISAC.
2. **Forget past mistakes.** One of the most important strategies of champions is the ability to forget their mistakes. The more you think and visualize the good throws, the more likely it will happen again. When you throw a bad throw, get over it and move on quickly. Visualize the next throw. Feel free to feel good when you make a nice throw. Make mental notes about the throw.
3. **Maintain positive self-talk and imagery.** To be a champion you must use your inner mind to guide you. Think positive thoughts and imagine what a good throw would look like. Think positive thoughts. Focus on making the perfect throw. Learn to concentrate and focus quickly.
4. **Practice being mentally tough and focus on the throw.** Many top throwers learned to developed a mental program to occupy their mind. Don't over-analyze each throw. Rely on muscle memory and concentration. Develop a mental program consisting of a series of conscious thoughts to follow throughout the throw. Discipline is key. Stay focused. Don't think about winning or losing. Stop your mind from drifting away.
5. **Enjoy the pressure of competition.** To have fun and succeed, you will have to love the pressure of competition. Anxiety, nerves and pressure are all normal and positive feelings. Just focus and take your best throw.
6. **Throw your average.** You can't expect to do much better than your average practice session. You must learn to be consistent. Don't try to throw better or stronger than normal. Your dart will go in different places. Don't try to throw better when you are behind and relax when you are ahead. Just throw your same old throws in the same old style. Take one throw at a time carefully, like the way you had always practiced and good throws will always follow through.
7. **Be prepared for anything.** To be successful you must be prepared for anything that could happen. Make sure you are prepared mentally and physically. Anticipate and prepare for equipment failures, changing weather conditions, etc.



Mid-Paleolithic Crisis

John Whittaker

February 2003

The Neanderthal lamented with a brow-ridge creasing frown,

"The Pleistocene's a different scene since sapiens came to town.

It looks like I am losing out, I fear I can't compete with an atlatl attitude and breath that smells of meat
When he swaggers with his breechcloth and dead muskrats on his feet."

He bared his teeth in speechless rage and sat upon a stone.

"Curse his CroMagnon modern ways - just leave us all alone.

Until he came Levallois flakes were everyone's best tool but now if you can't make a blade he laughs and calls you fool.

And I guess we'll leave this valley with its pleasant glacial cool."

"With spear throwers and harpoons he has massacred the game

He's the terror of the tundra, life will never be the same. And his modern paleo-diet - eating fish! Of course he reeks.

To nice warm caves the new caveman prefers a tent that leaks.

The old handaxe sufficed for Dad - I hate these technogeeks."

As he visualized the future, he smote his brow with woe, and scabbled in the gravel with a half-prehensile toe.

"He thinks he's so superior to us Neanderthals
He's just a new subspecies but he's got a lot of balls
Painting pornographic pictographs on other peoples' walls."

When it comes to courtship, comrades, a CroMagnon's bound to win

'Cause his brow ridges are gracile and he has a dimpled chin.

They have twenty different words for 'Give!' and not a one for 'Please!'

We can't eat'em or defeat'em, and they reproduce like fleas!"

Then Neanderthal, outmoded, shuffled off into the trees.

If all difficulties were known at the outset of a long journey, most of us would never start out at all.

William F. Buckley

S.A.L.T. Activities in Arizona

By Bob Sizemore

The early S.A.L.T. competitions in Arizona were a great success, especially Wintercount, where attendance gets bigger and bigger each year. The field round was set in the mesquite and ironwood of the Sonoran Desert. Weather was clean, calm and 75 degrees. How's that for February? About half of the participants in the field round and the ISAC were first timers. It's always great to see new people throwing spears and helping our sport grow. The high point of the day was a distance throw. Newcomers and old timers alike really enjoyed giving this their all, and it was a lot of fun. I recommend to other organizers who have the space to include this in their events. Other competitions at Wintercount included a primitive bow and arrow competition and a rock sling competition. For those of you that don't know, Wintercount is one of the premier primitive skills conferences in the country. It's a week long camp, where every sort of traditional living skills are taught. I was selected as an instructor, and conducted an atlatl and dart workshop, where students made their own atlatl and dart. For more information about primitive skills conferences contact Backtracks at PO Box 905, Rexburg ID 83440.

The competition at Pueblo Grande Museum in Phoenix, AZ is held in conjunction with their Ancient Technology Days, which attracts a lot of young people like Boy and Girl Scouts and Youth Groups, etc. We literally taught hundreds of people how to throw spears. It was a very satisfying and exhausting day. A field round and an ISAC were held in perfect 80-degree weather, and again the distance throw seemed to captivate those who tried it. I would like to mention that each year I give several atlatl presentations and Red Rock State Park in Sedona AZ is always the best. The park advertises this in the local community. Sedona is a resort area, so in addition to local residents, people from all over the world show up. I usually set up one target, do a short talk, do some show and tell, then let everyone try their hand at throwing a spear. The response is just great. Everyone loves it. And, I like the fact that I'm helping to promote the sport! So don't overlook opportunities in your area to get the word out about atlatl. Contact Boy and Girl Scout groups, Church Youth Groups, Local and State Parks, Museums, Historical Societies, etc. and check your state for it's archeological month. There is usually something that you can participate in. So help promote the atlatl, and you'll have a great time too.

Wintercount Field Round Results: Men: Tom Mills-65; Matt Graham-51; Jo DaBill-49. Women: Judy Pritchard-31; Bonnie Corey-27; Jo Guill-23. Youth: Malagro Mendoza-25; Chris Robbins-19; Dominic Beauregard-17.

ISAC: Men: Tom Mills-83; Dean Pritchard-79; Matt Graham-69; Women: Emily Kidder-51; Jo Guill-42X; Judy Pritchard 32.

.....
We Dolgans live on our fair earth,
with love we warm the ground.
...So plant this seed of peace and love
throughout the whole wide world,
then keep it warm with hope and trust.

OGDO AKSYONOVA

Dolgan, Artic
.....

Atlatl Tournaments

By Jim Gilligan

I'm often asked about running atlatl tournaments. In the early 90's the Michigan Atlatl Association set up one tournament per year. As popularity and enthusiasm increased, we kept adding new tournaments each year until finally we (mainly me) were setting up and running over a dozen per year. Enthusiasm of the organizers waned as events became more complex. Multiple contests were introduced from around the world, causing transportation and organization headaches.

Around then we were invited to participate in the monthly 3-D archery shoot at the Chelsea Rod & Gun Club. We showed up, paid the range fee of \$8, and headed for the woods and a pleasant morning of atlatling. All agreed that 3-D was quite a challenge, and the mood was relaxed since we didn't have any set-up or organization to worry about. Since then Chelsea Rod & Gun has encouraged atlatl use during their monthly shoot. And they have since added a permanent European style atlatl course and ISAC target.

Now we have more than 20 throws per year, but most are at either the outdoor range at Chelsea or at the indoor range at Wilderness Archery, a retail establishment. We still set up our big events: The Atlatl Marathon in May and The Summer Gathering in August, but we also have at least two atlatl opportunities per month with no set-up. Just pay and cast. The archery venues carry liability insurance and serve food as well! So my advice to anyone looking to organize an event: don't overlook potential opportunities to align with a local archery club or shop. You might even be able to recruit some new spear chuckers from the archery ranks.

Please be sure to check out the 2003 Michigan Atlatl Association Calendar. Be sure to keep an eye on our event schedule at <http://www.msu.edu/~oberg/MAA.EVENTS.html> as we're always adding new events.

Also, if you haven't checked out the website lately you owe it to yourself to do so. Chris Oberg has assembled what may be the premier atlatl site on the web:

<http://www.msu.edu/~oberg/index.html>

See you at an event soon!
.....

Learn from the mistakes of others.

You can't live long enough to make them all yourself!
.....

Meadowcroft Information

June 21 and 22, 2003

This year the atlatl contest will be 2 days, in a trial run for next year's WAA annual meeting. There will also be free primitive camping on Saturday night. (We can extend this to Friday night also if anyone is interested). The only drawback to the camping is we have to be locked in from 6:00 pm till 9 am. Frank and I will be camping so you won't be alone! Anyone questions email theatlatl@1st.net or phone 740-264-1755.
.....

Letters to the Editor

Hi everyone;

I thought I would let you all know were we stand at this moment, with having the Atlatl added as a legal hunting weapon in Wisconsin. Len. Reimersma

: Friday, January 17, 2003 8:37 PM

Hi

I thought that you would like to know that your proposal to allow hunting with atlatls passed the ex council of the conservation congress last Friday. It will appear on the questionnaire in April. We will try to have a descriptive picture with the question. However, it would be good to have people in as many counties as possible to explain the proposal.

I also thought you would like to know that the new DNR secretary (Scott Hassett) raised his hand to speak during the discussion. It turns out that he owns an atlatl.

Ed Harvey

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Dana and Kay Klein sent a reprint of an article written about Green Flats Atlatl Rattle August 2002 in Newsweek magazine. Check it out in the September 2, 2002 edition of Newsweek: *The Neo-Neolithic* in Lynn Phillips article, Letter from America Lynn Phillips (page 29)

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Hey guys:

Take a look at this cool web page!

<http://www.subtlemoon.com/paleo/>

Hapi

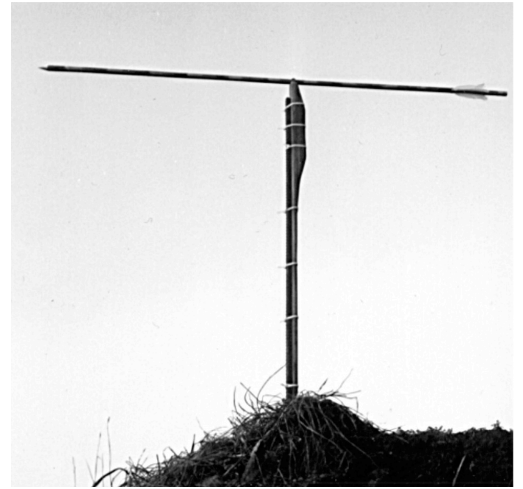
.....



Chuck (Half-Beard) Butorajac sends in this picture as Excuse # 37 for missing the bullseye!
(He had a 3 hour operation on the right wrist/hand and will be having the left one done in 6 to 8 weeks.)

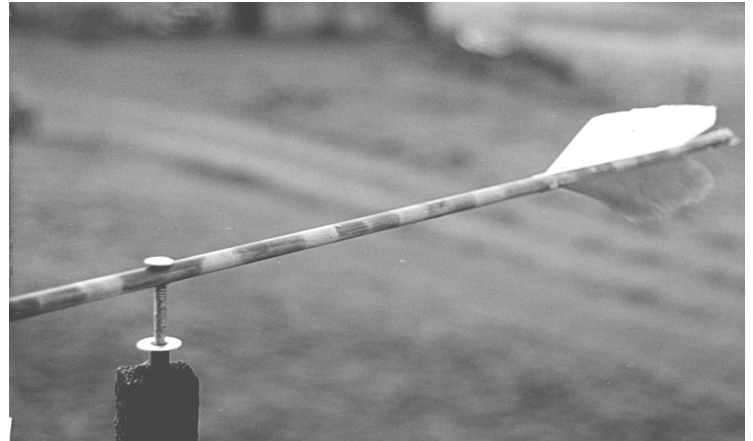
Hi Margie,

Here is an idea to recycle those old arrows and atlatl darts. Use them for weather vanes.



Drill a small hole in the top of a stake the same size as a piece of metal tubing. Put the tubing in the hole. Using a nail the same diameter as the tubing, drill a hole at the balance point of the dart or arrow (insert the nail). Add a washer to protect the wood against wear and you have a weather vane. Take this to your next atlatl meet for an excellent wind indicator.

Sincerely, Duane Spangler
Freeland, WA



~~~~~Thanks for submitting this unique idea, Duane! ~~~~Margie

As a human race, we have moments of incredible greatness, not power and control over things, but power to connect with Po-wa-ha, "water-wind-breath," the creative energy of the world, the breath that makes the wind blow and the waters flow.  
Rina Swentzell, Santa Clara Pueblo Indian



Laboratory of Experimental Archeology  
Laboratorio di Archeologia Sperimentale:  
By Alfio, Marco and Ilaria Tomaselli  
[www.archeologiasperimentale.it](http://www.archeologiasperimentale.it)

.....  
Question: What did dinosaurs have that no other animal ever had?  
Answer: Baby dinosaurs.  
.....

## Treasures From Icy Tombs

Melting glaciers in the Yukon lead to finds archeologists dream of. Mummies and Stone Age artifacts may go back 10,000 years.

Biologist Gerry Kuzyk was hiking with his wife in the remote reaches of the Yukon when he caught the putrid scent of caribou dung wafting through the chill air. Then he saw it - the biggest pile of animal droppings he had ever seen, 8 feet high and stretching over half a mile of mountain side.

Kuzyk, a researcher with the Yukon Department of Renewable Resources, knew there weren't enough caribou in the entire territory to create such an epic mound. Odder yet, there hadn't been caribou in the area for nearly a century.

It was like being in the 'Twilight Zone,' " said Rick Farnell, a colleague who helped investigate the find. "You could see them from a distance - big, black bands of feces. I'm talking tons of it."

The mystery was solved by lab analysis: The dung, the product of innumerable migrating caribou herds, had been frozen for thousands of years and only recently exposed by melting ice. Along with the dung, the scientists soon discovered an arsenal of Stone Age darts, arrows and spears.

The artifacts are just part of a trove of ancient artifacts, animal carcasses and human remains being disgorged by vanishing glaciers and ice patches across the globe as the planet's temperature gradually increases.

"It's like an Easter egg hunt," said Greg Hare, an archeologist with the Yukon Heritage Branch.

For most scientists, from ecologists to climate experts, the warming of the planet is a disturbing trend that could radically alter the environment. But for archeologists, it has prompted a breathtaking treasure hunt.

Without doing any digging, the scientists are scooping up artifacts, mummies and fossils long hidden in the depths of monstrous glaciers. "We walk right up and pull arrows and animals out of the ice," Farnell said.

Many of the items are simply the random debris of 10,000 years of passing human and animal traffic. But the glaciers also have coughed up some stunning finds.

"It's incredible what's in the ice," said E. James Dixon, an archeologist at the University of Colorado's Institute of Arctic and Alpine Research.

Piece by piece, the artifacts rising from the ancient ice are beginning to recast archeologists' understanding of the thousands of years after the last great Ice Age: an epoch when animals began probing the northern fringes of the planet and bands of humans began to populate North America in large numbers.

"There's a whole new scientific window opening," said Dixon, an expert on the human colonization of North America.

Unlike buried dinosaur fossils or crumbling Mayan monuments, the glacier artifacts are relatively unchanged from the day they were first encased in their icy tombs. They have given scientists a glimpse of the past, frozen in icy perfection.

Arctic lupine seeds frozen for 10,000 years, for example, grew into healthy plants once they were removed from Ice Age lemming burrows. The ice holds a zoo of perfectly mummified animals: fish, wapiti, sheep, mountain goats, moose, voles and birds "They're so beautifully preserved, they look like they're asleep," Farnell said. "You can't tell whether they died last week or died 4,000 years ago." For archeologists used to piecing together the past from chips of flint, finding soft organic material is rare bounty. They have flesh filled

with DNA, feathers and dustings of ancient pollen. There are stomachs filled with the remnants of a last meal and patchworks of human tattoos.

Unbroken arrows sport intact feathers. Darts colored by red ochre have soft sinew lashings. One stone knife found in the Yukon sports caribou hairs. Another has bloodstains. "It actually killed something," Farnell said.

Lying next to 6,800-year-old stone points are 3,500-year-old dart hurlers and 6-foot spears. Animals dead for just a few years lie next to 3,000-year-old carcasses. One of the best-known discoveries is the frozen mummy found in the Alps in 1991. Named Otzi after Italy's Otztal Alps, the ice man was found by two hikers who spotted the corpse embedded in the melting Schnalstal glacier.

In 1999, a trio of sheep hunters at the edge of a glacier in northwestern British Columbia found a piece of wood on the ground, an unusual sight in that barren area above the tree line. It turned out to be part of a carved walking stick.

Further exploration turned up the corpse of the unfortunate "Kwaday Dan Sinchi," or "long ago person found." Radiocarbon dating showed the twenty-something man had lived in the 1400s, decades before Columbus reached the New World. Found with the body were a carefully woven waterproof hat, a gopher-skin cloak and a leather pouch filled with snacks of plants and fish.

The discovery confirmed the oral traditions of the local Champagne and Aishihik First Nations, which describe the glaciers as trade routes to the coast.

"There are a lot of stories about the glaciers and people traveling back and forth," said Diane Strand, the tribe's heritage resource officer. "And there are stories about people who never came back."

Tools found near Kwaday Dan Sinchi were made from both coastal and interior trees. The gopher cloak came from the interior while the cedar and spruce root hat was in the coastal style. Modern tribal weavers had never seen the hat pattern before but are now re-creating it to preserve history and reuse its excellent design, Strand said.

It's only one of the many tantalizing bits of information that have begun to emerge from the disappearing ice.

The discoveries have answered a simmering debate in North American archeology over when bow-and-arrow technology took hold. Some experts argued that bow and arrows existed for thousands of years alongside the earlier dart-throwing weapons known as atlatls. It had been difficult to trace the development of the technology with only stone tips that could have come from either type of weapon.

"Here, we've got the whole projectile system," Hare said. The many weapons discovered in the Yukon show that the atlatl was key from 7,300 to 1,200 years ago. The bow and arrow showed up 1,200 years ago and then dominates, Hare said.

Melting ice in the Yukon and also in the Colorado Rockies has revealed bison carcasses in high mountain regions, suggesting that these herbivores of the Plains roamed farther and higher than previously thought. A Giardia lamblia cyst in one 5,000-year-old caribou dung pellet has conclusively shown that the intestinal bug was a long-standing pest in North America and not brought over by European explorers as some had believed.

Genetic analysis of caribou remains found amid the Yukon dung heap is revealing the dynamics of these ancient herds and helping find ways to preserve their endangered modern kin.

By Usha Lee McFarling, Times Staff Writer

Thanks to emailer Paladin for submitting this.

## YEAR 2003 OFFICIAL LIST OF ATLATL EVENTS

The World Atlatl Association

- Mar 28, 29, 30 12th Annual Atlatl Gathering at Valley of Fire State Park, Overton, NV  
Atlatl Contests, three ISACs Leni Clubb - [waaleni@earthlink.net](mailto:waaleni@earthlink.net). (760) 358-7835
- Apr 5 Chelsea Rod & Gun Club, Chelsea MI practice ISAC,  
Jim Gilligan (810) 599-6881 [primitive1@chartermi.net](mailto:primitive1@chartermi.net)
- Apr 5, 6 Atlatl Competitions & ISACs Ramioul, Belgium - 4/5 - 1800, 4/6 - 1530  
Steve Cabaroux at [bn276248@belecom.net](mailto:bn276248@belecom.net) or Christian Lepers at [christianlepers@swde.be](mailto:christianlepers@swde.be)
- Apr 6 Spring Knap-In at Chelsea Rod & Gun Club, w/ 3D course and official ISAC  
Jim Gilligan(810)599-6881 [primitive1@chartermi.net](mailto:primitive1@chartermi.net)
- Apr 9 - 13 7th Annual and LAST North Georgia Knap-in, Gatewood Park, near Lake Altoona, Cartersville, GA Atlatl contests & ISACs each day.  
Mark Bracken (770) 345-7305 or [crackinbrackin@juno.com](mailto:crackinbrackin@juno.com)
- Apr 12 Atlatl Program at Howell Parks and Recreation Dept, MI  
Jim Gilligan (810) 599-6881 or [primitive1@chartermi.net](mailto:primitive1@chartermi.net)
- Apr 15 Ann Arbor Indoor Atlatl League & practice ISAC  
Jim Gilligan (810) 599-6881 or [primitive1@chartermi.net](mailto:primitive1@chartermi.net)
- Apr 18, 19, 20 Earthday Gathering & Mastodon Open, ISAC all three days, EMC Club, Waverly, NY  
Jack Rowe (570) 888-5258 or [fieldwalker@stny.rr.com](mailto:fieldwalker@stny.rr.com)
- Apr 26, 27 Atlatl Program at the Red Bud Trail historical event in Indiana  
Jim Gilligan (810) 599-6881. or [primitive1@chartermi.net](mailto:primitive1@chartermi.net)
- Apr 26, 27 Atlatl Demos, Fun throws - 10am to noon, ISAC noon both days.  
Horican National Refuge, Horicon WI Fun throws & demos to 3 pm Saturday and 2 pm on Sunday. Len Riemersma (920) 528-454 or [lenmary@dotnet.com](mailto:lenmary@dotnet.com)
- Apr 26, 27 Third Annual Atlatl Contest & ISAC on Saturday, tour of Blackwater Draw on Sunday, Eastern New Mexico University, Portales, NM  
David Batten (505) 562-2750 or [davidbatten@enmu.edu](mailto:davidbatten@enmu.edu)
- May 2, 3 Annual Idaho State Open Atlatl Competition & ISAC on Saturday, Celebration Park, Melba, ID Dean Pritchard [atlatlist@msn.com](mailto:atlatlist@msn.com) or (208) 323-0293
- May 2, 3, 4 Old Stone Fort, Manchester, TN, ISACs all three days,  
5/2 - 4 pm; 5/3 - 2 pm; 5/4 - 10 am. Atlatl demonstrations & instruction..  
Keith Wimberly (931) 723-5073 or [Keith.Wimberly@state.TN.US](mailto:Keith.Wimberly@state.TN.US)
- May 4 Chelsea Rod & Gun Club 3-D course & practice ISAC, Chelsea, MI  
Jim Gilligan (810) 599-6881 or [primitive1@chartermi.net](mailto:primitive1@chartermi.net)
- May 10, 11 "Spring Fling" at Fogelman's, Turbotville, PA Local Contests ISACs all days  
Gary Fogelman (570) 437-3698 or [iam@uplink.net](mailto:iam@uplink.net)
- May 17, 18 Ft. Osage Throw, Local throw on Sat, ISACs both Days. Ft. Osage, MO  
Ray Madden (417) 781-0962 or [rmadden@hotmail.com](mailto:rmadden@hotmail.com) or  
Ron Mertz (314) 822-2514 or [ronald.mertz@slps.org](mailto:ronald.mertz@slps.org)
- May 20 Ann Arbor Indoor League & practice ISAC Ann Arbor, MI  
Jim Gilligan (810) 599-6881 or [primitive1@chartermi.net](mailto:primitive1@chartermi.net)
- May 23, 24, 25, & 26 Sixteenth Annual Meeting of WAA in connection with the Primitive Archery Rendezvous and the Michigan Atlatl Marathon, Wilder Creek Conservation Club, Marshall, MI ISAC all four days.  
Leni Clubb - [waaleni@earthlink.net](mailto:waaleni@earthlink.net) or (760) 358-7835 or Jim Gilligan - (810) 599-6881 or [primitive1@chartermi.net](mailto:primitive1@chartermi.net)**
- May 23, 24, 25 Second Annual Environmental Showdown, West Almond, NY. ISACs & local contests all three days ISAC Fri. 4 pm; ISACs Sat. & Sun. 1 pm  
Karen Finnemore (585)593-7435 [Finnemka@alfredstate.edu](mailto:Finnemka@alfredstate.edu)
- May 24 Mastodon State Park Paleo Indian Spear Factory Day, Demonstrations & ISAC at 2 pm  
John Bierman [dspmast@mail.DNR](mailto:dspmast@mail.DNR) or (636) 464-2976
- Jun 1 Henschels Farm Artifact Museum, ISAC at noon, Wisconsin Challenge atlatl contest following Artifact Show. Elkhart Lake, WI Len Riemersma (920) 528-7454 or [lenmary@dotnet.com](mailto:lenmary@dotnet.com)
- Jun 1 Chelsea Rod & Gun Club, 3-D course & practice ISAC, Chelsea, MI  
Jim Gilligan (810) 599-6881 or [primitive1@chartermi.net](mailto:primitive1@chartermi.net)
- Jun 6, 7, 8 Illinois Atlatl Assn. Throws, Chaplin Creek Historic St, Franklin Grove, IL. ISACs and Local contests all three days Don Asp (815) 456-2305
- Jun 6, 7, 8 Flintknapping Rendezvous & Atlatl Competition at Indian Springs Ranch, Wrightwood, CA ISACs all three days, 24 target "California Hunter's Round on Saturday afternoon.  
Tom Mills(626) 794-9158 or [PaleoAleo@aol.com](mailto:PaleoAleo@aol.com)
- Jun 6, 7, 8 Atlatl Events at Flint Ridge Memorial Park, Flint Ridge, OH 6/6 Set up at atlatl range 1pm, practice 3pm ISAC 5 pm; 6/7 Ohio Standard Accuracy 10 am to 6 pm ISAC 5 pm; 6/8 Ohio Standard Accuracy 10am to 3 pm ISAC start at 10 am. Sat. & Sun. - Demos and training for public  
Mound Builders (740) 344-1919 Hapi Cummings -[moundbuilders@cgate.net](mailto:moundbuilders@cgate.net)
- Jun 6, 7, 8 Eleventh Annual Atlatl Competition in connection w/Utah Heritage Days and Fremont Indian Days at Fremont Indian State Park, Sevier, UT. Atlatl contest on Five Fingers Ridge, ISACs and American Field Round in new Campground area. ISAC all three days. Utah Heritage Days May 31-June 8. [peteweimer@utah.gov](mailto:peteweimer@utah.gov) or (435) 527-4631
- Jun 6, 7, 8 "Atlatls in Action", ISAC all three days, EMC Club, Waverly, NY  
Brandon Anderson, (607) 565-7901 or Jack Rowe - (570) 888-5258 or [fieldwalker@stny.rr.com](mailto:fieldwalker@stny.rr.com)
- Jun 13, 14, 15 The Leavenworth IN Knap-In and Atlatl Throw at Leavenworth, IN. Indiana State Contest and ISACs each day.

Richard Lyons (812) 246-9987 or [atlatlin@theremc.com](mailto:atlatlin@theremc.com) or Eric Morris(812) 739-2358

Jun 13, 14, 15 Genesee Valley Atlatl Shoot & Knap-In, Local Contests & ISACs at Island Park, Wellsville, NY Bob Chaffee (585)593-4043 or [bobchaffee@adelphia.net](mailto:bobchaffee@adelphia.net) or Jack Brown (585) 593-4678 or [jac@stonesnbones.com](mailto:jac@stonesnbones.com)

Jun 17 Ann Arbor Indoor Atlatl League & practice ISAC Ann Arbor, MI  
Jim Gilligan (810) 599-6881 or [primitive1@chartermi.net](mailto:primitive1@chartermi.net)

June 20, 21 Sun Circle Days, at Falls of Ohio State Park, Clarksville, IN. ISAC each day & Indiana State Championship contest each day.  
Richard Lyons (812) 246-9987 or [atlatlin@theremc.com](mailto:atlatlin@theremc.com)

Jun 21 Turkey Run Heritage Festival, ISAC & Indiana Atlatl Contest & Public Throws at Turkey Run State Park, Marshall, IN Don Fisher, (317) 475-9770 [atlatlguy@yahoo.com](mailto:atlatlguy@yahoo.com) or Barbara Cummings (765) 597-2654

Jun 21, 22 Primitive Gathering, Atlatl, ISAC, Primitive Archery & Flintknapping, 6066 Boy Scout Road, Dover, OH Ken at (330) 756-2041 or [axetowax@yahoo.com](mailto:axetowax@yahoo.com)

Jun 21, 22 6th Annual Atlatl Event, Meadowcroft Rock Shelter Avella, PA Atlatl Contests & ISACs both days, free camping on grounds Sat night.  
Margie Takoch (740)264-1755 or [theatlatl@1st.net](mailto:theatlatl@1st.net)

Jun 21, 22` Fifth Annual Bald Eagle Knap-In and Atlatl Tournament, Janesville Community Park Janesville, PA Tim Jackson (814) 684-0402 or [PaTeePee@aol.com](mailto:PaTeePee@aol.com)

Jun 28, 29 Atlatl Demos Saturday 6/28 in conjunction with a Rendezvous, ISAC at noon, Hunter's Challenge to follow. 6/29 ISAC at 10 am. Len Riemersma (920) 528-7454 or [lenmary@dotnet.com](mailto:lenmary@dotnet.com)

Jul 3, 4, 5 Brockway 4th of July Celebration, Knap-In & Atlatl Spear Throwing + ISACs, Recreation Park Teener League Field, Brockway, PA.  
George Miller (814) 265-0435 or [lmiller@greatlite.com](mailto:lmiller@greatlite.com)

Jul 6 Chelsea Rod & Gun Club 3-D course & practice ISAC, Chelsea, MI  
Jim Gilligan (810) 599-6881 or [primitive1@chartermi.net](mailto:primitive1@chartermi.net)

Jul 11, 12, 13 Sun Mountain Gathering, Museum of Indian Arts & Culture, Santa Fe, NM Atlatl events & ISACs all three days Chris Turnbow (505) 476-11251 [orcturnbow@miaclab.org](mailto:orcturnbow@miaclab.org) or Bob Sizemore (520) 466-6104 or [bobandcarolathome@yahoo.com](mailto:bobandcarolathome@yahoo.com)

Jul 11, 12, 13 Atlatl Competitions & ISACs all three days at Keefers, 8315 Sweetwater Road, Ft. Loudon, PA Terry Keefer (717) 349-2262 or [tk1003534@cvn.net](mailto:tk1003534@cvn.net)

Jul 11, 12, 13 15th Montana Mammoth Hunt, Atlatl Contests and ISACs all three days all days. Rattlesnake Butte, Montana City,, Montana City MT,  
Troy Helmick (406) 266-3398

Jul 15 Ann Arbor Indoor League & practice ISAC, Ann Arbor, MI  
Jim Gilligan (810) 599-6881 or [primitive1@chartermi.net](mailto:primitive1@chartermi.net)

Jul 18, 19, 20 First Annual "Wahkpa Chu'gn" Buffalo Jump Atlatl Event, Havre, MT. European Field Round & ISACs all three days. Anna Brumley (406) 265-6417 or Jim Ray (406) 736-5274

Jul 19 Holiday Park Atlatl ISAC & Indiana Contest & Public Throws, Indianapolis, IN  
Don Fisher (317) 475-9770 or [atlatlguy@yahoo.com](mailto:atlatlguy@yahoo.com)

Jul 19, 20 Alder Acres Atlatl Tournament, Lorraine, NY  
Rodger Klindt (315) 639-6293 or [mammut@juno.com](mailto:mammut@juno.com)

Jul 25, 26, 27 Atlatl Events at Flint Ridge, ISACs, Ohio Standard Accuracy and ISACs all three days. Demos & training for public Sat. & Sun Hapi Cummings (740) 344-1919 or [moundbuilders@cgate.net](mailto:moundbuilders@cgate.net)

Jul 26, 27 Saegertown Artifact Show, Local Contests & ISACs Saegertown VFW, Saegertown, PA  
Gary Fogelman [iam@uplink.net](mailto:iam@uplink.net) or (570) 437-3698

Aug 1, 2, 3 Illinois Atlatl Assn. Throws. ISACs and Local contests all days, Chaplin Creek Historic Site, Franklin Grove, IL  
Don Asp (815) 456-2305

Aug 3 Chelsea Rod & Gun Club, 3-D course & practice ISAC, Chelsea, MI  
Jim Gilligan (810) 599-6881 or [primitive1@chartermi.net](mailto:primitive1@chartermi.net)

Aug 7 - 10 Great Lakes Primitives Gathering on Bois Blanc Island, Mi. Official ISACs all four days, WAA Grand Champion Award Saturday. Jim Gilligan (810) 599-6881 or [primitive1@chartermi.net](mailto:primitive1@chartermi.net)

August 8, 9, 10 Second Annual Persied Primitive Arts Weekend Local Contests & ISACs all three days, Start at 5 pm w/ Torchlit ISAC, Camp Gross, Cassadaga, NY Ben Brauchler (716) 679-7145 or [ben@netsync.net](mailto:ben@netsync.net)

Aug 15 "That Dam ISAC at Steve's Pond", Albany, OH, in connection with 4<sup>th</sup> Annual Oh State Accuracy Contest the next 2 days. Steve Barnett (740) 698-6553 or [barnz@juno.com](mailto:barnz@juno.com)

Aug 16, 17 Fourth Annual Ohio State Accuracy Competition, + ISACs at the Albany Riding Club, Albany, OH ISAC both days (in connection with "that Damn ISAC" the day before)  
Steve Barnett (740) 692-6553 or [barnz@juno.com](mailto:barnz@juno.com) or Ray Strischek (740) 592-3465

Aug 22,23, 24 Stone Tool Show and ISACs each day, Letchworth State Park, Castile, NY  
Lou Hillman (585) 442-1342 or [LBHNDP@rit.edu](mailto:LBHNDP@rit.edu)

Aug 23, 24 Atlatl Competition & ISACs - Tarascon-sur-Ariege, France  
Emmanuel Demoulin [emmanuel.demoulin@wanadoo.fr](mailto:emmanuel.demoulin@wanadoo.fr)

Aug 29,30, 31 Atlatl Events at Flint Ridge Memorial Park, Flint Ridge, OH - ISACs, Ohio Standard Accuracy Contest Dates & time same as June 6, 7,8. Demos & training. Ohio Atlatl Association Annual Meeting, Saturday noon. .  
Moundbuilders (740) 344-1919 or Steve Barnett (740) 692-6553 or [barnz@juno.com](mailto:barnz@juno.com)

Sept 6 Second Annual River Road Park Atlatl contests & ISAC, River Road Park, Carmel., IN  
Don Fisher (317) 475-9770 or [atlatlguy@yahoo.com](mailto:atlatlguy@yahoo.com)

Sept 7 State Championship at Chelsea Rod & Gun Club Chelsea, MI. Four contests including Official ISACs, WAA Grand Champion awarded as well. Jim Gilligan (810) 599-6881 or [primitive1@chartermi.net](mailto:primitive1@chartermi.net)

Sept 12, 13, 14 Tioga Shoot-Out, ISAC all three days EMC Club, Waverly, NY  
Jack Rowe, (570) 888-5258 or [fieldwalker@stny.rr.com](mailto:fieldwalker@stny.rr.com)

Sept 12 13, 14 Cahokia 2003;. European, local contests, and ISAC, plus ISAC only on the 12<sup>th</sup>

- Ron Mertz [ronmertz@planet-save.com](mailto:ronmertz@planet-save.com) or (314) 628-9376 or Ray Madden [rhadden@hotmail.com](mailto:rhadden@hotmail.com) (417) 781-0963
- Sept 13, 14 PawPaw Festival, Albany Ohio at the Lake ISACs & Ohio Standard Accuracy Contests  
Steve Barnett (740) 692-6553 or [barnz@juno.com](mailto:barnz@juno.com)
- Sept 18 Ann Arbor Indoor League & practice ISAC Ann Arbor, MI  
Jim Gilligan (810) 599-6881 or [primitive1@chartermi.net](mailto:primitive1@chartermi.net)
- Sept 19, 20, 21 3rd Annual Burnt Hollow Fall Hunt, Atlatl contests & ISACs, Deer Lodge, MT  
Lem Oehrtman (406) 846-1004
- Sept 20, 2003 Archaeology Day at Mastodon State Park, near St. Louis, MO. Demonstrations, local contests & ISAC. Contact: Ron Mertz  
[ronmertz@planet-save.com](mailto:ronmertz@planet-save.com) (314) 628-9376 or John Bierman (636) 464-2976 [dspmst@mail.dnr.State.mo.us](mailto:dspmst@mail.dnr.State.mo.us)
- Sept 20, 21 Annual PA State Championships & ISACs, Naugles Farm, near Somerset, PA  
Chuck Butorajac (724) 238-6878
- Sept 26, 3rd Annual Ulm Pishkun Atlatl Contest +ISAC Connie Jacobs (406) 866-2219  
Sept 26, 27 Coconino Community College Third Annual Atlatl Event in connection with the Flagstaff Festival of Science, Flagstaff, AZ. ISACs both  
days, Field Rounds, exhibitions, flintknapping, weaving, etc. Jerry Bacon [Gerald.Bacon@NAU.EDU](mailto:Gerald.Bacon@NAU.EDU)
- Sept 27 Graham Cave, west of Danville, MO in Missouri State Park, Local Atlatl Contests and ISAC Ron Mertz [ronmertz@planet-save.com](mailto:ronmertz@planet-save.com) or  
(314) 628-9376 or Ray Madden [rhadden@hotmail.com](mailto:rhadden@hotmail.com) or (417) 781-0963
- Sept 28 Chelsea Rod & Gun Club, Chelsea, MI, 3-D course & practice ISAC.  
Jim Gilligan (810) 599 6881 or [primitive1@chartermi.net](mailto:primitive1@chartermi.net)
- Oct 3, 4, 5 Flintknappers Rendezvous & Atlatl Competition, Indian Springs Ranch, Wrightwood, CA. ISACs all three days. 24 target "California  
Hunter's Round on Saturday afternoon.  
Tom Mills (626) 794-9158 or [PaleoAleo@aol.com](mailto:PaleoAleo@aol.com)
- Oct 4, 5 Lake Atwood PowWow, Lake Atwood, Ohio ISACs & Ohio Standard Accuracy Contests both days, Public Demos and atlatl & dart  
Instruction for public both days. Ray Strischek (740) 592-3455 or [db8947@dragonbbs.com](mailto:db8947@dragonbbs.com)
- Oct 11 Holiday Park Atlatl ISAC, Indiana Atlatl Contest, & Public Throws, Indianapolis, IN  
Don Fisher (317) 475-9770 or [atlatlguy@yahoo.com](mailto:atlatlguy@yahoo.com)
- Oct 21 Ann Arbor Indoor Atlatl League & practice ISAC Ann Arbor, MI  
Jim Gilligan (810) 599-688 or [primitive1@chartermi.net](mailto:primitive1@chartermi.net)
- Oct 25 Rural Ohio Appalachia Revisited (ROAR) Days, Local Contests & ISACs, Lake Hope Zaleski National Forest. near Zaleski, OH Steve  
Barnett (740) 698- 6553 or [barnz@juno.com](mailto:barnz@juno.com)
- Nov 18 Ann Arbor Indoor Atlatl League & Official ISAC Last league meet of 2003 capped with Official ISAC. Jim Gilligan (810) 599-6881 or  
[primitive1@chartermi.net](mailto:primitive1@chartermi.net)
- Nov 28 Turkey Toss & Last Gasp ISAC, Brighton Recreation Area. Brighton, MI. Last MI event of the year with Official ISAC Jim Gilligan  
(810) 599-6881 or [primitive1@chartermi.net](mailto:primitive1@chartermi.net)

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## HOW Hard Does It Hit?

### A Revised Study of Atlatl and Dart Ballistics

By Daryl Hrdlicka

#### INTRODUCTION:

Anybody who has tried an atlatl and dart knows that it's a powerful combination (ancient people used it to hunt mammoth, after all). But nobody ever seems to know exactly HOW powerful it is -- on the internet, you will find pages that say it's anywhere from 3 times to 100 times more powerful than a spear thrown by hand. That's a lot of difference, and nobody ever says (or shows) how they came by their figure.

To settle it (and to find out which was nearest the truth), I sat down and made some calculations about different projectile weapons, including atlatl darts. In the end, I came up with three variables for comparison -- how hard it hits (**kinetic energy**), how hard it is to stop (**momentum**), and how effectively it penetrates (**sectional density**). These are explained in more detail later.

There are many other factors, of course. The sharpness of the point, its shape, and its diameter all make a difference. A wider blunt point will expend most of its energy simply pushing through the skin, while a narrower sharp one will slice through easily and go in deeper. And while an arrow is good for close range, it simply doesn't have the effective range of a .30-06. An atlatl has an even shorter effective range.

Since there can be (and have been) an infinite number of variations on projectile shape, weight, speed, range, etc., there is no realistic way to account for them all. That being the case, I'm just looking at these three main factors. That will give at least a general guideline to an atlatl's hunting effectiveness.

#### PROJECTILES:

I used a number of projectiles, both ancient and modern, in order to show where each ranks in terms of kinetic energy, momentum, and sectional density. NOTE: These are average weights, speeds, and diameters.

- Light Spear (equivalent to a javelin): 2 pounds, 50 mph, 1" diameter
- Heavy Spear (equivalent to a Roman pilum): 5 pounds, 25 mph, 1 1/2" diameter
- Light Atlatl Dart: 3 ounces, 100 mph, 1/2" diameter
- Heavy Atlatl Dart: 6 ounces, 75 mph, 5/8" diameter
- Primitive Arrow: 700 grains, 170 fps, 3/8" diameter
- Modern Hunting Arrow: 540 grains, 220 fps, 11/32" diameter
- .357 Magnum handgun bullet: 125 grains, 1450 fps, .357" diameter
- .30-06 rifle bullet: 180 grains, 2600 fps, .30" diameter

As you can see, bullets and arrows are measured in grains and feet per second (fps). Darts and spears are measured (if ever) by ounces and miles per hour. Since we need to use the same units of measurement to get any meaningful results, here are the conversion factors I used.

- 1 pound = 16 ounces = 7000 grains
- 1 ounce = 437.5 grains = 0.0625 pounds
- 1 mile per hour = 1.47 feet per second

**KINETIC ENERGY:**

- ***Kinetic energy = 1/2 x Mass x Velocity 2***

(Mass is the weight of the object (in pounds) divided by the pull of gravity (32.2 ft./sec/sec). Velocity is the change in position divided by the time in which the change occurs (the rate of speed).)

When an object is in motion, it has kinetic energy. When it strikes something, that energy is transferred. This is the basic *force of impact* - how hard the weapon strikes the target. Kinetic energy is measured in "foot pounds" (the energy needed to exert a one pound force for a distance of one foot).

**KINETIC ENERGY CALCULATIONS**

In Descending Order

| <u>Projectile:</u> | <u>Weight:</u> | <u>Velocity:</u> | <u>Kinetic Energy</u> |
|--------------------|----------------|------------------|-----------------------|
| .30-06 Rifle       | 180 grains     | 2600 fps         | 2701 ft. lbs.         |
| .357 magnum Pistol | 125 grains     | 1450             | 583                   |
| Light Spear        | 2 pounds       | 73.5             | 167                   |
| Heavy Spear        | 5 pounds       | 37               | 106                   |
| Heavy Dart         | 6 ounces       | 110              | 70                    |
| Light Dart         | 3 ounces       | 147              | 63                    |
| Modern Arrow       | 540 grains     | 220              | 58                    |
| Primitive Arrow    | 700 grains     | 170              | 45                    |

Kinetic energy was calculated as follows:

Light Dart:

$$KE = 1/2 \times (\text{lbs.} / \text{gravity}) \times (\text{velocity in fps})^2$$

$$KE = 1/2 \times (.1875 / 32.2) \times (147 \text{ fps} \times 147 \text{ fps}) = 63 \text{ foot pounds}$$

.357 Magnum:

$$KE = 1/2 \times ((125 / 7000) / 32.2) \times (1450 \text{ fps} \times 1450 \text{ fps}) = 583 \text{ foot pounds}$$

Kinetic energy is very dependent on velocity. A bullet, because it is moving so fast, has incredible amounts. A .30-06 has roughly 60 times the kinetic energy of a primitive arrow. And yet Native Americans used those primitive arrows to hunt not only deer, but bison as well.

A rough guide for hunting effectiveness based on kinetic energy (this is an archery chart) is:

| <b>Kinetic Energy</b> | <b>Hunting Usage</b>                               |
|-----------------------|----------------------------------------------------|
| < 25 ft. lbs.         | Small game                                         |
| 25 - 41 ft. lbs.      | Medium Game (deer, antelope, etc.)                 |
| 42 - 65 ft. lbs.      | Large Game (elk, black bear, wild boar, etc.)      |
| > 66 ft. lbs.         | Toughest Game (bison, cape buffalo, grizzly, etc.) |

As you can see, both the light dart and the heavy dart seem weak compared to firearms, but they have more kinetic energy than arrows. Looking at the Hunting Usage chart, you can see that they would be sufficient to bring down even the toughest game -- assuming it is in the effective range. For an atlatl, the effective range is perhaps 50 yards, but over 30 yards they will start losing velocity, which means less kinetic energy.

Kinetic energy is often used as **the** standard for projectile effectiveness, but a baseball (5.12 ounces moving at 95 mph) has 87 foot pounds of kinetic energy. It actually strikes harder than an atlatl dart, but I can't really see hunting a bison with a fast ball. While kinetic energy determines how **hard** an object strikes, it doesn't determine how far it penetrates. That's where momentum comes in.

**MOMENTUM**

- ***Momentum = Mass x Velocity***

Momentum is the tendency of an object in motion to STAY in motion. Anyone who has pushed a car in neutral and then tried to stop it will understand this -- the more momentum it has, the more resistance it will take to stop it. Momentum is measured in "slug feet per second".

**MOMENTUM CALCULATIONS**

In Descending Order

| <u>Projectile:</u> | <u>Weight:</u> | <u>Velocity:</u> | <u>Momentum</u>  |
|--------------------|----------------|------------------|------------------|
| Heavy Spear        | 5 pounds       | 37 fps           | 5.75 slug-ft/sec |
| Light Spear        | 2 pounds       | 73.5             | 4.57             |
| .30-06 Rifle       | 180 grains     | 2600             | 2.08             |
| Heavy Dart         | 6 ounces 110   | 1.28             |                  |
| Light Dart         | 3 ounces 147   | .86              |                  |
| .357 magnum Pistol | 125 grains     | 1450             | .80              |
| Primitive Arrow    | 700 grains     | 170              | .53              |
| Modern Arrow       | 540 grains     | 220              | .52              |

Momentum was calculated as follows:

Light Dart:

$$\text{Momentum} = (.1875 \text{ pounds} / 32.2) \times 147 \text{ fps} = .86 \text{ slug-feet/second.}$$



.357 Magnum:

$$\text{Momentum} = ((125 \text{ grains} / 7000) / 32.2) \times 1450 \text{ fps} = .80 \text{ slug-feet/second.}$$

Flesh normally has a density of about 1 gram per cubic centimeter. Hide is more dense, bone is about twice that (2 g/cc), and organs are less dense. Projectiles with a lower momentum, like the arrows, may have trouble penetrating thick hide and can be stopped fairly easily if they hit bone. Projectiles with a lot of momentum, like the spears, will go through hide, flesh, bone, and organs, penetrating until they encounter enough resistance to stop them. More momentum also means the projectile is less likely to be deflected by branches or underbrush, so it can be used in different types of terrain.

In addition, momentum is a factor in "knockdown". A heavy atlatl dart has enough momentum to knock a 40 pound animal completely off its feet and will definitely affect a larger animal. Objects with less momentum, like the arrows or the .357 magnum, will have a much smaller effect. (Movies and TV shows lie -- a handgun bullet simply will **not** knock a person off their feet. The difference in mass is too great. And if you **did** have a handgun that could do that, the recoil force would shatter the wrists of the shooter.)

You can see that the darts are much more effective in terms of momentum, even better than the .357 magnum. Mass and velocity are equally important in momentum, and darts have quite a bit of mass. It would take more resistance to stop them, which means they would be more effective at penetrating deeply enough into the target to hit a vital area.

But penetration also depends on **where** you hit. If you hit an animal in the ribs, most of the momentum will be lost getting through them. If you hit it in the stomach, the dart will penetrate much deeper. Arrows, with such low amounts of momentum, simply had to be aimed to where they could penetrate deeply enough.

But momentum alone isn't enough for calculating penetration -- if you filled a 5 gallon pail full of sand and fired both the .357 magnum and the primitive arrow at it, the bullet would be stopped by the sand, while the arrow would pass through completely. Our baseball, with 1.31 slug-feet/sec. of momentum, would simply bounce off. What makes the difference? Sectional density.

### SECTIONAL DENSITY

#### • *Sectional Density = Weight / Diameter<sup>2</sup>*

(Weight is measured in pounds; diameter is measured in inches.)

A Ping-Pong ball thrown at a pop can will bounce off. A BB will go right through. What makes the difference? The sectional density. Even though they may weigh the same, in a BB the weight is much more concentrated. Since it is striking a smaller area on the target, more of the momentum is conserved, and it will penetrate deeper. Other factors being the same, a denser projectile will always penetrate more effectively than a lighter one. Sectional density is measured in pounds per square inch.

#### SECTIONAL DENSITY CALCULATIONS

In Descending Order

| <u>Projectile:</u> | <u>Weight:</u> | <u>Diameter</u> | <u>Sectional Density</u>  |
|--------------------|----------------|-----------------|---------------------------|
| Heavy Spear        | 5 pounds       | 1.5"            | 2.222 lbs/in <sup>2</sup> |
| Light Spear        | 2 pounds       | 1"              | 2.000                     |
| Heavy Dart         | 6 ounces .625" | .960            |                           |
| Light Dart         | 3 ounces .5"   | .750            |                           |
| Primitive Arrow    | 700 grains     | .375"           | .711                      |
| Modern Arrow       | 540 grains     | .344"           | .653                      |
| .30-06 Rifle       | 180 grains     | .30"            | .285                      |
| .357 magnum Pistol | 125 grains     | .357"           | .140                      |

Sectional Density was calculated as follows:

Light Dart:

$$\text{SD} = .1875 \text{ pounds} / (.5" \text{ diameter} \times .5" \text{ diameter}) = .750 \text{ pounds per square inch}$$

.357 Magnum:

$$\text{SD} = (125 \text{ grains} / 7000) \times (.357" \times .357") = .140 \text{ lbs/in}^2$$

Sectional density is why the arrow passes through the sand, the bullet is stopped by it, and the baseball bounces off. The primitive arrow, with .711 lbs/in<sup>2</sup>, is denser than a bullet., which means the momentum is conserved more efficiently. The baseball, with its high kinetic energy and momentum, has a sectional density of only .039 lbs/in<sup>2</sup>. The weight is spread out over such a large area that the momentum is easy to stop, meaning there is no penetration.

Atlatl darts are very effective in terms of sectional density. The weight of the long shaft is concentrated in the small diameter, making them more efficient than either arrows or firearms (even the mighty .30-06). This means that the momentum is conserved better, which means the darts will penetrate better.

### CONCLUSION:

No one of the three factors we looked at is an indicator of hunting effectiveness by itself. All the weapons listed have been used for killing, and all have proven themselves effective. Atlatl darts do not have as much kinetic energy or momentum as firearms, but have a better sectional density. They are higher in all three factors than arrows, and arrows are known to be very effective weapons. There is very little you can't bring down with a well-placed arrow.

Is an atlatl as powerful as a .30-06? No. It has less kinetic energy (force of impact) and less momentum (penetration). It doesn't have anywhere near the effective range and is much harder to aim. But for tens of thousands of years, it was the primary hunting weapon on earth. Dart points have been found in mammoth bones, and they have been tested on modern elephant carcasses with impressive results. While it may not be **as** effective as a rifle, it is certainly effective enough. Just how dead do you need your supper?

## Bibliography

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<http://www.alaskafrontierarchery.com/Articles.html>

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<http://homepage.ntlworld.com/joetapley/target.htm>

"Airgun Ballistics" by Robert Beeman

<http://www.beemans.net/airgun%20ballistics.htm>

Atlatl and elephant information:

<http://www.enteract.com/~mpavlac/sportsex.htm>

"The Sectional Density of Rifle Bullets" By Chuck Hawks

<http://www.chuckhawks.com/sd.htm>

In addition, **many** thanks to Leroy Madden, who took the time to tutor me on physics and who helped me write this second version of the article. I literally couldn't have completed it without him.

Daryl Hrdlicka,  
Jeffers Petroglyphs Historic Site  
Revised December 9, 2002

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### Why do they throw IV& V

By Anne-Françoise,

with the collaboration of Marie-Jeanne and Steve.

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#### Column Break

**Guido Pirotte**, Genk, Belgium 42 years old



Tourism promoter in Zonhoven and Biology, physics, geography and chemistry teacher, Guido was hired by the township of Zonhoven to promote the tourism of the town.

Because of the presence of a silxshining stone in Zonhoven, he organized visits for archeology lovers. He observed that a lot of

people were interested in archeology.

To improve the visits, he took an interest in the animations he could propose on the site and he heard in 1996 about Christian Casseas who is a Flemish speaking animator at the prehistory site of Ramioul. Christian taught him to throw with atlatl and bow among other things. Guido met the "Chercheurs de la Wallonie" and took part in atlatl contests. He organized his first atlatl contest in Zonhoven in 2001.

He likes atlatl very much because it's a lively activity in connection with the Zonhoven flint shiningstone.

He appreciates throwing to meet other archeology lovers with whom he can exchange ideas...and good moments.

**Christian Lepers**, Rochefort, Belgium 37 years old



Chemist in a drinking water society + Responsible for the Rochefort scouts unity + currently responsible for the European Atlatl Championship organization

.Christian as a child was already interested in history and archeology.

He was a cub master and he organized in 1991 a camp with a theme :

prehistory.

He collected material all around this subject and got information about the atlatl contest organized by the CEDARC (Centre d'études et de documentations archéologiques) in Treigne. He went to the contest as a spectator and met partakers from Ramioul. They got on well together and he took part in the creation of the prehistoric bow section of the Chercheurs de Wallonie.

He took part in bow and atlatl contests in 1992 and participated actively in a lot of activities of the team in Ramioul.

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#### Section Break (Continuous)

His experience in the scouts unity helped him to accept to share the organization of the contests in Europe with the TAJ (Tir aux Armes de Jet) of Dordogne when Pascal Chauvaux passed the buck. He likes to throw because contests and other activities are good opportunities to meet friends, other archeology lovers and he can go further with his passion of prehistory

**Bärbel Berhorst**, Schlüchtern (Frankfurt) Germany 47 years old



Galerist. 6 years ago, in 1996, she went to a museum speaking about archeology in Frankfurt. Demonstrations of an atlatl throw were organized. She found it was funny.

She read an article concerning bow written by Johan Tinnes later. Her husband and children made their throw material + one for Bärbel and the family went to the contest in

Oerlinghausen. She found she was not very

talented... her children had better results than she had.

She is interested in history, she likes to discover new plants, eatable vegetables..., so she likes to come to the contests to discover new places in the convivial context of the atlatl contests. Her dog Doni likes to go with her because she likes to run after the arrows of the competitors...

**Frank Reusen Ann Reusen**, Schoten (Anvers), Belgium. 42 years old 12 years old



Plumber. When he was a child, Frank was already interested in archeology: a teacher found an arrowhead and showed it to his pupils. Frank made bows and played with them during a large part of his childhood

He went on holiday to "Les Eysies de Tayac" in

Dordogne when he was 25 years old. This visit in the French archeology capital city was his first real contact with the archeology. He went back there several succeeding years. He heard there about Treigne and Ramioul in Belgium. He was interested in the atlatl and bow contests and made his own throw material. He participated in 1995 in his first contest in Ramioul and later went to several contests in Belgium, France, Germany and even Finland. He likes to discover new places thanks to the atlatl and bow contests and to meet people in this context

**Mervig Fielder**, Dortmund (Deutschland) 26 years old



Carpenter. Mervig, as a child used to play he was an Indian: he made his bow and shot like Indians do. He took later an interest in manufacturing bows and tried to make bows with better performance than the ones he used to make before.

He observed in 1994 the atlatls shown in the museum of Oerlinghausen. Back home, he went into the woods and found a

branch with a perfect atlatl shape. He made spears and practised throwing with his own atlatl.

His father was a teacher at the Dortmund archaeological museum. Johan Tinnes (D) came in the museum for a bow shooting demonstration. Mervig observed his techniques and material and took part in a W.E. organised by Yohan Tinnes to learn how to make bows.

He took part to his first atlatl and bow contest in Oerlinghausen in 1996 with this fresh made bow.

His experience interested him in a historic club (a club with people who like to learn more about general history). He demonstrated to them how to make and throw with atlatl and prehistoric bow.

He continues to throw because he likes to experiment new technologies in atlatl and archery and to throw together with friends.

**Alain Helbert and Patricia**, Hiertzbach Alsace (France) 51 years old



Ranger. When he was 10, he used to make bows in hazeltree, eldertree.

When he was 30, he moved on to modern bows, but very simple ones, for 15 years.

Afterwards, modern bow

competition spirit didn't motivate him any more and he didn't enjoy throwing any longer. He turned to "home made" bows. He felt the authentic pleasure of having his own made bow adapted to him.

Some friends informed him about bow and atlatl contests and he took part to his first contest in Solutré in 1998.

Since then, he takes part in 5 or 6 competitions a year. He appreciates the contests because of the meetings and exchanges he has there and he is interested in lighting fire with prehistoric methods. In the beginning he was only an archer but he discovered atlatl and he is now trying to be a good atlatl thrower.

Note from the writer: Alain is the second best thrower in archery in the European contest this year 2002. He is also very friendly, modest and never shows off.

He is always ready to help others.

**Christian Normand** called Dreki (after the name of a "Viking" ship prow Droisy), Normandie (France). 57 years old.



Ethnoarcheologist; works in the army on the airbase of Evreux on an ancient site of the American army as a gunsmith master. Christian's interest for archaeology dates back to his childhood. When he was 12 years old, he received a flint axe. He tried to

make a handle to use his axe. He collected information about prehistoric glue.

When he was 14, he met Paul Emile Victor the French specialist of the North. He was fascinated by his descriptions of the way of life in the extreme life situation of the North.

Christian liked to study in arms. He was interested about every kind of arms: war armament, shooting arms... he shot with old black powder guns.

He studied archaeology at the university and made his end work about prehistoric glue methods. He found work in the French army and held his archaeological research as a passion, in collaboration of Mr JJ Kreyemer, manager of the archaeological museum of les Eizies de Tayac. He travelled to Greenland for 1 month to learn how to survive there. He saw people throw atlatl from their boat.

His knowledge about the Palaeolithic period helped him find and teach techniques for soldier in survival situation. He discovered the atlatl contests in 1992. He went to the contest of les Eizies de Tayac (F) as an observer. He took part in the contest of Brogne (B) some months later.

He likes the contests, not for the competition side but either for what happens before and after the contests: to meet people with similar passion and to interchange ideas thereabout.

**Philippe Pirson**, Spy (Belgium) 57 years old



Retired, modern language teacher. Born in Spy, Philippe used to play with his friends in the woods all around the village and naturally in the cave of Spy. They made bows and arrows in hazeltree. His schoolteacher told them about the cave and the man of Spy. There were flints, bones exhibited in the classrooms during all his primary school years.

He moved later and had no more contact with

prehistory.

Some years ago he moved back to live again in Spy. His son learned geology in the university and worked as an animator in Ramioul. Philippe retired and spent his time learning to flintknapping.

Nearby in activities in Ramioul, he collaborated in the creation of the association of the man of Spy. He likes to do experimental archaeology and to guide people in the cave.

Christian Casseyas in Ramioul motivated him to throw bow and atlatl and to take part to the contests. He's more interested in instinctive shooting. For him, to take part in the contests is a recreational activity; he likes this archaeological microcosm.



### Why Do They Throw / What Made 'em Do It?

This is a fun addendum to the newsletter.

Anne Francoise Cabaraux has put a lot of work into getting these little bios of the Europeans. (Thanks, Anne!)

It would be fun to do this for others, too. I tried to do some, but found I do not have the time to gather the info.

So I thought You could do it that for me! Send me an email or snail mail letter with your name, age, home town, and in under 200 words, explain how you got into atlatl and what keeps you doing it!





ON TARGET  
by Leni Clubb

Each year just before the Annual Membership Meeting, the Board of Directors wants to know if any of the members have any suggestions, questions, complaints/gripes, and brilliant ideas for "the betterment of The World Atlatl Association". This is your chance to "get your two cents worth in" by contacting one of the Board in your area to let him/her know what you are thinking about. A Roster of the Board of Directors is printed on page 6 in this issue and has

telephone numbers and e-mail addresses. We welcome your ideas and will be pleased to discuss it at the Executive Board Meeting which will be held on Friday, May 23rd in the Club house at Wilder Creek (see the schedule of events on page 3). If you have something to say, please let your area representative know as soon as possible in order that your idea/suggestion can go on to the Agenda for the meeting. This is YOUR organization,

please help the Board to make it the best ever.

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Speaking of the Annual Meeting, if you miss this one, you will miss possibly the best membership meeting held since we organized. Jim Gilligan has done a spectacular job of arranging for contests, speakers, fun things to do. There will never be a dull moment!! You may wish you were two or more people so you won't miss anything.

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Organizers: Not many of you have requested Grand Champion Awards for your various events. Remember, the brass plaques are available free of charge for each of your scheduled events. In the packet sent you last year was a form to fill out to request one. If you do not have a form, just e-mail, write or call me and Ill send one out promptly. (The World Atlatl Association has available a GRAND CHAMPION AWARD, at no cost to organizers, which is intended to recognize the skill of the First Place Winers in three categories - Men, Women, Youth in a FINAL contest or from accumulated high scores in multiple contests during a single weekend atlatl event. All categories must be represented in calculating the scores and determining the winner. ISAC SCORES MAY NOT BE INCLUDED.)

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I feel very sad that I had to send out so many "You have received your last newsletter" letters this quarter and have not received many replies with dues. I offered to update to March 2004 if the payment was made by the end of this month. Don't let this happen to you. Check the date printed alongside your name on the mailing label to find your expiration date and send in your membership dues so that you won't receive a "Dues are Due" notice insert in your newsletter. I hate to do that.

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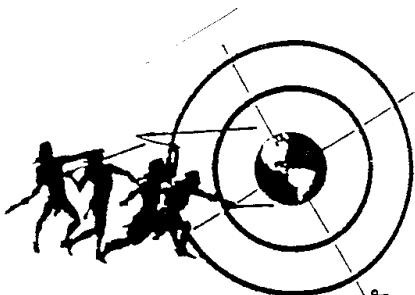
waaleni@earthlink.net (760) 358-7835

Membership in the World Atlatl Association is \$15.00 per year; family membership is \$20.00.

Send all inquiries and dues to WAA Secretary:

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